NEW DISCOVERIES ALL OVER THE EARTH

Why Your SILK SKIRTS CRACK Along The Folds

Many Manufacturers Make SILK 75 PER CENT. TIN to Give It False Weight

THOUSANDS upon thousands of women have discovered to their great surprise and sorrow that their silk skirts had cracked along the folds while the garments were yet practically new.

But out of these thousands upon thousands of women probably not a score of them knew that the real reason for this was that they were wearing more of a tin skirt than a silk one. In other words, their handsome, soft, rustling silk garments with the rich sheen were made up of about 60 to 75 per cent tin, and the remainder pure silk, or pure silk except for an ounce or two to the pound of coloring matter.

Again many a woman, in fact probably nearly every woman has been surprised and angered because new silk waists have become discolored and rotted under the arms and about the neck. Again, it was the tin that was to blame for this. The salts in the perspiration act upon the tin and other foreign matter in the silk in a manner that not only discolors it, but causes it to rot, and in Summer it is practically impossible to avoid this unless one is certain of getting pure silk.

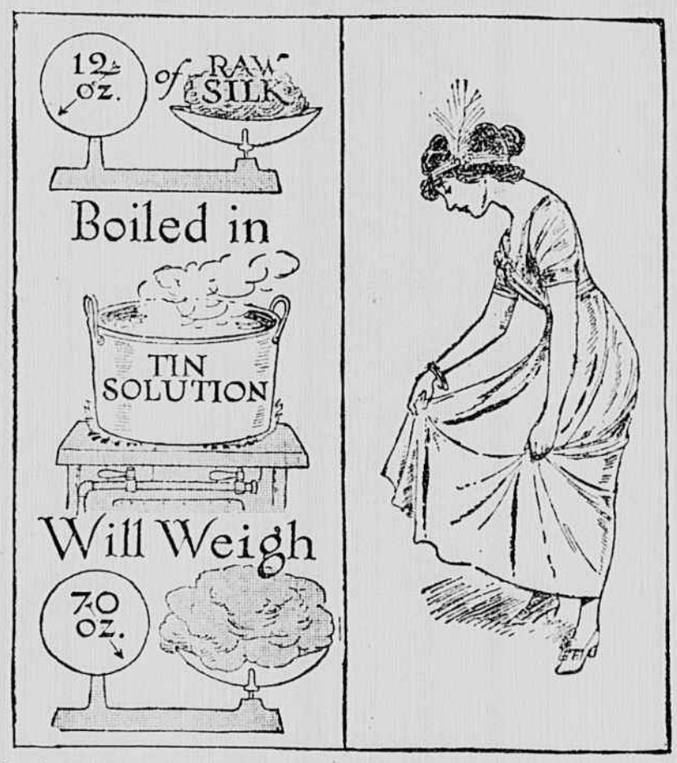
The woman who walks along the street in a handsome silk gown that rustles softly is extremely proud of her dress, but she does not know that every twelve ounces of silk, pure silk, in her dress, has been so weighted with pure tin that this original twelve ounces is made to weigh sixty or seventy ounces, and there are instances, according to the very best of authorities, where twelve ounces of pure silk is made to weigh as much as eighty ounces.

There is a simple method for finding out whether a piece of silk goods has been adulterated or weighted, as the manufacturers call it, with tin, and that is to cut off a small sample and burn it. Pure silk is animal matter, just as feathers or hair, made, as every one knows, by the silk worm. Now if pure silk is burned it will instantly curl up into a crisp mass, just as a burnt hair or feather will do. But if the silk goods has been adulterated with from 60 to 75 per cent of tin, it will not do this. It will leave an ash in the semblance of the fabric, much as a burned piece of newspaper will leave an ash that still shows the printing. The harder and more firm this ash, the more tin there was in the silk.

Silk manufacturers claim that competition is so great they cannot afford to produce pure silk goods. They admit they do produce some, but it is so expensive only those with plenty of money can afford to buy it.

The pure silk goods, such as were manufactured at the time our grandmothers and great-grandmothers made their wedding dresses, wore and wore without any signs of splitting or cracking in the seams. This was because it was pure silk, with no foreign matter in the goods. No tin was put in those goods, and there are probably thousands of women who have these old dresses as heirlooms, and they find the silk apparently as good as ever.

The great injustice of weighting silk with tin is that there is nothing to inform the public of this. Poor women can afford to buy silk because some of it is so cheap, but it very soon wears out, and so they are really worse off than before. It has been suggested that the manufacturers be made to plainly label all their silks, with such explanations as the following, "Weighted with 60 per cent tin." This should not only be on the silk labels, but should be woven into the selvage every yard or two.



Nearly All Raw Silk for Fabrics Is Boiled in a Tin Solution to Give It False Weight. This Causes Silk Skirts to Crack in the Folds, Frequently Before They Have Been Worn a Dozen Times.

When the raw silk goes to the manufacturer it is just as it came from the silk worms, and it contains quite a lot of gummy matter that has to be boiled out. This boiling process, which removes all the impure matter and all the animal matter, reduces the weight of the original raw silk about four ounces to every pound.

"But," explains one big manufacturer of silk threads, "this loss of four ounces is generally made up when the silk is dyed, so that there is really no such thing as a four-ounce loss to every pound for the manufacturer."

"And when these manufacturers insist that weighting silk with so much tin or other mineral substances does not lessen its resistance to wear, they have little justification for such a claim," a representative of a well-known firm of silk manufacturers declared.

It is true that the pure silk goods will not crack at the seams, nor discolor or rot readily by means of perspiration, and it is true that much of the modern silk skirts, and especially the silk petticoats worn a few years ago, would crack along the seams and along the creases in the plaiting and flounces, frequently after a week's wear.

When the raw silk is put through the boiling process to remove the gummy animal matter, and the dyes are added, this dye bath also contains dissolved tin and other weight producers, making twelve ounces of pure silk gain in weight, as already stated, from 60 to 75 and even 80 ounces. Silk doctored to such a degree is worthless, according to the best of authorities. When it is exposed to the air the liquid tin absorbed by the fiber in the dye bath crystallizes, and when the fabric (called silk by courtesy) is put under strain, like that of wearing it made up in garments, these crystallized particles actually cut the pure fibres and therefore cause the cracks and ruin the cloth.

And so it is that if you buy a common grade silk dress, the sort that women have regarded as "pure silk" for years, the little silk worm has furnished about 25 per cent. of it and the brawny laborers in the Cornwallis or other tin mines have furnished 75 per cent of it.

HOW YOUR HEART Rests More Than It Works

YOUR heart rests thirteen hours out of the twenty-four in the normal adult. Its work is done during the systole or forcing out, and the diastole or the relaxation lasts just one-twelfth longer than the working period, so that when the twenty-four hours have elapsed the heart has had thirteen hours rest and only eleven hours work. It is, therefore, a great mistake to speak of the "unresting heart." If it did not rest it could not stand the strain, in fact, if it is forced to beat too rapidly, either by drugs or any disorganization of the system, it soon breaks down, for strong as the muscles are they cannot work continuously, but must have rest to regain power.

While it is true that the heart is the great motive-power which keeps the blood flowing through the arteries and veins, it is a mistake to regard it as a force-pump, which drives the blood all the way it is to go. But it must have rest between its muscular contraction or it wears out very quickly.

If the work of the heart were to be compared with the work of a man the necessity for sleep would soon be clear. Almost any healthy man could walk a thousand miles in six weeks, walking a little over eight hours a day, at an easy pace, and resting for the remainder of each day. Almost any one thinks that he could walk a thousand miles in a thousand hours, but it is no mean feat, as was shown by an English soldier, Captain Barclay. Some few men have tried to outdo the captain by walking a thousand miles in a thousand half-hours, but few could perform this great task. The way Captain Barclay and other athletic pedestrians accomplished this task was to walk two miles at a time, the first mile at the end of one hour or half-hour, and the second at the beginning of the next hour or half-hour, so as to get as much unbroken sleep as possible. If he walks at the rate of a mile in fifteen minutes, he gets an hour and a half for sleep between every walk when walking a thousand miles in a thousand hours, but he only gets one-third as much sleep, namely, half-an-hour between his walks when going a thousand miles in a thousand half-hours. It is plain that no living man could walk a thousand miles in a thousand quarter hours, because he would get no rest at all, and if he increased his pace so as to snatch a little rest the strain would be so great that he could never finish.

This is precisely what happens when the heart is forced to do too much work, either by over-exertion or by the strain of disease. If it is compelled to beat more quickly than normally it is quickly exhausted, for nearly the whole time needed for the diastole or rest is taken up in labor, even though the systole be slightly shortened. For this reason when the pulse is very rapid the physician bends every effort to decreasing the rate of the heart's beating by cold applications or by drugs, which slow its action.

The natural question which arises is: What happens to the system while the heart is taking its necessary rest. When the beat is over the valves to the aorta close tightly and the heart is cut off from the circulatory system. What force is it then which is carrying on the circulation in these resting intervals? The answer is a very simple one. In adults whose arteries are normal the arteries are very elastic, and when the heart-force-pump drives the blood out they are stretched greatly. The moment the force stops the elasticity of the arteries makes these vessels try to come back to their normal size, and in this way the blood with which they are gorged is forced forward by the energy stored in the elastic walls. They might be compared to the watch-spring which is wound up every night and thus stores the energy for running the wheels all day. The walls of the arteries store the energy from the heart between each beat and send the blood along its course. This elasticity of the arteries also serves to regulate the flow of the blood, so that it does not shoot through them at each beat of the heart, but is slowed down and distributed gradually and in proper proportion to all parts of the body. Thus it is plain that while the heart rests the arteries do its pumping work, even more effectively than it could do itself.

Why an Angry CHILD Always STAMPS Its Feet

THERE are a few universal habits in the human race which have strange primitive origins, and there are some which are universal because they have a physiological stimulus, and one of these latter is the habit that a little child often has of stamping its feet when angry. Exactly the same thing occurs when a man, when he is angry, brings down his fist on the table. In both cases it is due to lack of nervous control.

The nervous system is a unit, and most of the emotions of anger come from a sudden thwarting of a calculated nervous plan. Thus, if we are about to sit down on a chair and a mischievous urchin yanks the chair away just as we have let the muscles of the thighs relax, the anger excited is out of all proportion to the actual bruises that have resulted. If a child wants a pot of jam and is denied he is immediately angry, unless he has been taught to control himself. The desire for the jam, for example, has set in motion a nerve plan, and when this is suddenly stopped there is a flow of nervous energy which has to spend itself in some way. In the case of the child, he usually works this off by stamping his feet and crying. In the case of the man, he usually goes through exactly the same processes by thumping the table and swearing; in the case of a hysterical woman, she beats upon the floor with her heels and screams. It is all the same thing.

Strange as it may seem, moreover, the outflow of emotion is far better for an angry person than it is to bottle it up. Emotion is going to express itself in action somewhere, and if the muscles are kept still the brain cells will be exhausted instead. Emotional force has got to go somewhere—it can't just stop and disappear. Too great a suppression of the emotions leads to a gradual atrophy of them, and when the emotions begin to die out the person himself or herself is of comparatively little use to the world. It is for this reason that nothing should ever be done to "break" a child's temper, but only to guide it into right channels. You can teach a child not to lose control of his temper, but never, as you value the child's development, try to train him not to be angry.

A New Relationship to the Monkey

IN the early days of Darwinism the question of the evolution of man was constantly misrepresented, as though it had been made to appear that man is descended from a monkey. For fifty years zoologists and biologists have been industriously explaining that the succession was not direct, but that man was descended from the root stock of the primates, of which the apes were a distinct branch. Now, as soon as that more correct way of stating our ancestry comes to be fully understood, there has been discovered a new relationship between man and ape which bridges the gap and makes the old popular idea seem nearer to the truth than the scientific statement.

Like a great many modern discoveries, the factors are highly technical, but the broad outlines serve to reveal in a general way the importance of the discovery. One of the principal differences between man and the lower animals has been in the actual cell processes that happen in the building up of the body. These changes, or metabolism, are really fundamental to life, and are the evidence of life. So that, when a large difference appears between man and the animals in the important basic fact of life, the diversity is really far greater than in some outward appearance that would show far more.

In this particular case uric acid is the peculiar product considered. Uric acid is a product which is principally peculiar to man—the breaking up of certain bases, known as purins—producing in the other animals an entirely different stage, known as allantoin. Even in the common monkey the macacus—which is largely used in laboratory experiments—this difference exists, and the same is true of the baboon. But a long series of experiments, conducted in the most careful and scientific way by Dr. Wiechowski, of Prague, have resulted in the proving of the fact that the chimpanzee, one of the anthropoid apes, shares with man this power of producing uric acid. As this product is shrewdly suspected to have some relationship to rheumatism—though only in certain types of that disease—it is doubtful whether the chimpanzee is to be congratulated upon his possessing this human characteristic, but it places him in the highest group, even above his fellow anthropoids, the orang-outang and the gorilla.

It has for some years been known that the anthropoid apes showed a close comparison with man in their blood characteristics, especially in the preparation of serum, for precipitins which have been prepared with especial significance to man are equally available for the anthropoid apes, though utterly unapplicable to the monkey. But the discovery of a bridge over the gap between man and ape in the important branch of metabolism is a missing link of far more importance than a primitive ape-human skeleton would be. It welds, even more tightly, the wonderful chain whereby all living beings are drawn together in the eternal struggle upward.

Healing WOUNDS and SORES with PURE SUGAR

By Dr. L. K. HIRSHBERG.

PROFESSOR Geheirmrath G. Magnus, of the General Hospital of Munich, Germany, has demonstrated that sugar, when properly used, is the best thing in the world for sick or ailing tissues. It is, he says, a disinfectant superior to any of the popular poisons, such as mercury, carbolic acid, zinc, and the other numerous and commonly used toxic dressings for wounds.

Professor Magnus has now used sugar in the treatment of injuries for five months with the most promising outcome. Instead of inducing fermentation, infections and putrefactions, as has hitherto been asserted, it really prevents such complications in wounds, if the sugar has itself been first thoroughly sterilized. Sugar applied to the sore spot not only dissolves any clots or crusts present, but it particularly stimulates the tissues to protect themselves from the invasion of the germs that cause blood poisoning.

Sugar induces fluids to form in the wound which aid materially in washing and rinsing away the foreign and contagious matter. It is favorable, also, for healing the injuries, and deodorizes the spot better than any of the well-known remedies.

Moreover, Dr. Magnus has discovered in his experiments that the the human body is able to not only enjoy, but tolerate, such strong sugar solutions. He even went so far as to offer himself for tests. He injected, for example, a ten per cent. solution of sugar in water into his own arm. At the same time he gave his other arm an equal amount of salt water. There was no unpleasant effect whatsoever in either instance.

These investigations of the Munich physician show that sugar is both harmless and antiseptic. It confirms the researches of an elder savant, Dr. Kuhn, who maintained against great scepticism, as well as unjust accusations of quackery, that sugar applied in the treatment of suc h inflammatory troubles as "peritonitis" will help materially toward its cure.

Dr. Magnus applied sugar solutions and dried sugar to ulcers of the legs, sores on the hands and open wounds generally, and during the several months of his rigid tests he has been uniformly successful under its influences in healing them all.

There must be an emphatic understanding that the sugar be pure, clean and free from dust, air, dirt and invisible germs. This assurance cannot be had if the sugar is taken from the table or from the grocer's and dashed in a haphazard fashion upon the open sore. The proper application of a sterilized sugar can only be made by a physician or surgeon who is aware of the importance of bacterial-free wound dressings.

With the inauguration of sugar as a means to protect open injuries, to encourage healing and to aid in the body's upbuilding, there will be smaller cost—for all the methods and antiseptics now used are expensive—less trouble and an ever-ready, handy method of treatment.

Why Stars Do Not Really Twinkle

PROFESSOR F. W. ELDRIDGE-GREEN, of London, has made claims that, if nothing else, spoil our old favorite poem of childhood days which begins:

"Twinkle, twinkle, little star," for the professor says the stars do not twinkle at all. In fact he says the twinkle is all in our eyes, and he means it literally. Of course, he doesn't say it in quite this manner. In fact he is rather technical about it, but he is a noted savant and has made many ponderous reports to learned British societies, so it is to be expected. His claims are interesting, nevertheless.

The "twinkling" of the stars is not due to something in interstellar space, nor to the earth's atmosphere, says the professor, and to prove his point he rigged up artificial stars in a dark laboratory, and also adduced as evidence the well-known phenomenon of "seeing stars" when you are struck a blow on the head. He placed a small light in a dark room. A bull's-eye lantern five and one-half inches in lens diameter at one thousand yards was equivalent to his little light at twenty feet distance. If this is looked at in a dark room without moving the eye, the light will twinkle exactly like a star.

In this experiment you will notice that pale, bluish-violet circles start at the outside and gradually contract at the centre. On reaching the centre the light brightens. Another simple experiment he used to show that it is your sensitive retina and not the outside which causes the "twinkling" was to open your eye as you awake in the morning, then to look at the ceiling. At first a star-shaped, irregular black spot will appear. On closing the eye again a bluish-violet circle appears, spreads, contracts, and then, after breaking up into a star-shaped figure, it becomes brighter, disappears and is followed by another contracting circle.

If you open your eye as the star figure is formed in the centre, it will appear as a rose-colored star, much brighter than any other part of the field of vision. If, however, you wait until the star has broken up and disappeared before opening the eye, it will be found that only a black spot is seen in the centre. Many psychologists confirm these discoveries of the British investigator, and certainly there is no proof that star figures appear in the outside world.

Indeed, we know that the distant stars, as well as the distant earthly lights, are round or globular, not star-shaped as they appear in the "twinkling of an eye." Venus, the evening star, looks "star-shaped" until it is enlarged by looking through a telescope. Then you become convinced that it is big and round.

The Best PEARL Is the TOMB of a WORM

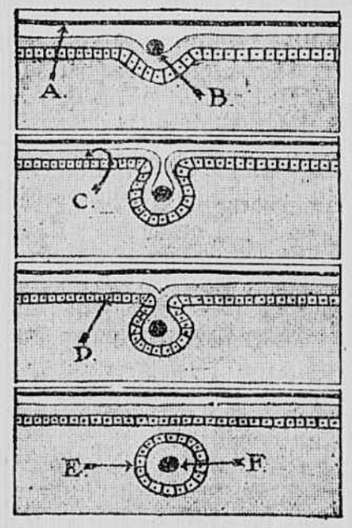
THE oyster makes a pearl to get rid of the annoyance of an enemy, generally a worm, that sneaks inside his shell. But in doing this he comes nearer being "hoist by his own petard" than any other thing known in the lower order of life.

While he gets rid of the troublesome worm or other foreign matter by making a pearl around it, he makes himself so much more valuable to man by this process that his life is in ten times the danger it was from the object that caused his first annoyance.

Sometimes a pearl is the result of a grain of sand getting inside the shell which the bivalve is unable to dislodge. But recent investigations have shown that the pearls resulting from a grain of sand are by no means as valuable as those resulting from worms. And so it is that the really valuable pearls are nothing more or less than tombs for cestode or trematode worms. It is the cestode worms that seem to be responsible for the best grade of pearls, with the trematode worms for the second grades.

The manner in which the oyster makes the pearl is extremely simple. Every step of the process has not been learned by naturalists. In the first place the foreign matter, generally a worm, works itself inside the shell of the oyster. The oyster is unable to get rid of it and it continues to annoy him.

Now the black line (A) represents the outer shell of the oyster, with the lime next to that. (B) is the



The Text Describes How the Black Spot (B) Which Is Generally a Worm, Is Entombed in Shimmering Pearl by the Oyster.

worm or other foreign matter. When the oyster finds he cannot dislodge the worm he begins to deposit a layer of mother-of-pearl (C) around it. The oyster is constantly building his shell by this means. When the foreign matter is covered with sufficient mother-of-pearl the oyster stretches his outer skin (D) until the edges meet where they grow together and detach that portion encircling the mother-of-pearl-covered worm.

In time the deposits begin to increase until the layer after layer of iridescent mother-of-pearl has formed the actual valuable pearl. The outer skin now wears away or dissolves and leaves the smooth round pearl. In fact, it leaves the worm so entombed that it is perfectly harmless.

To be exact, a pearl is merely a lump of carbonate of lime mixed with organic matter, which shows its wonderful colors only because of its layer after layer of the mother-of-pearl structure. Pearls are found in various bivalves, although the oysters furnish most and generally the best. Sometimes the color of the pearl depends upon the feeding beds which determine the tints of the lime from which the oyster makes its shell. This gives rose pearls or brown or so-called black pearls.

And so the beautiful woman whose throat is adorned with a string of rare and almost priceless pearls is really wearing a string of insect-coffins around her neck.

Sometimes the oyster can cover the worm or grain of sand with mother-of-pearl and entomb it against the inner side of the shell, leaving a little knot of protuberance of real pearl. These are cut out for scarf-pins and buckles and are known to the trade as "half pearls." But they are, like the round pearls, the tomb of some unfortunate worm that dared venture inside the oyster's shell castle.